

Haemophilus influenzae Infection, Invasive

Agent: *Haemophilus influenzae* (bacteria)

Mode of Transmission: Person-to-person transmission by inhalation of respiratory droplets or direct contact with nose and throat secretions from an infected person or an asymptomatic carrier.

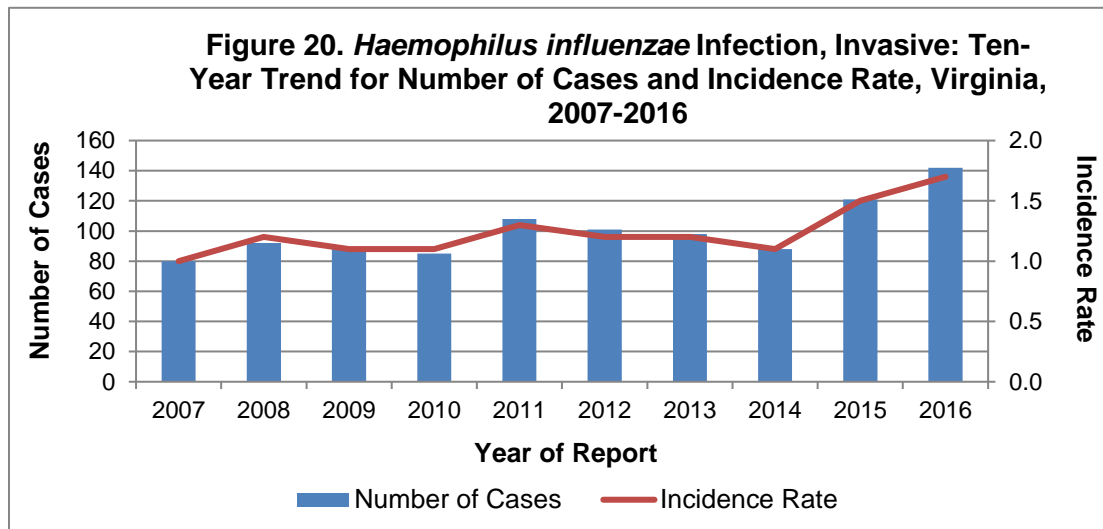
Signs/Symptoms: Inflammation of the lining of the brain and spinal cord (i.e., meningitis), inflammation of the epiglottis which may lead to blockage of upper airway and death, pneumonia, deep skin infection, arthritis, or bloodstream infection.

Prevention: Vaccination with a 3 or 4 dose series (depending on manufacturer) of conjugate *Haemophilus influenzae* type b (Hib) vaccine beginning at 2 months of age and concluding with a booster at 12 to 15 months of age. If vaccination is delayed, children 7 months of age and older may not require a full series of three or four doses. The total number of doses a child needs to complete the series depends on the child's age at the time the first dose is administered.

Other Important Information: *Haemophilus influenzae* is categorized into two major groupings: encapsulated and non-encapsulated. Encapsulated strains are more virulent and produce a polysaccharide capsule which is further characterized into six antigenically distinct serotypes (types a through f). Nontypable serotype results indicate a non-encapsulated strain. Vaccine is currently only available for one serotype, type b. In the pre-Hib vaccine era, type b organisms accounted for 95% of all strains that caused invasive disease. Since the licensure of conjugate Hib vaccine in the late 1980s, the incidence of invasive Hib disease in the U.S. has declined by more than 99% compared with the pre-vaccine era.

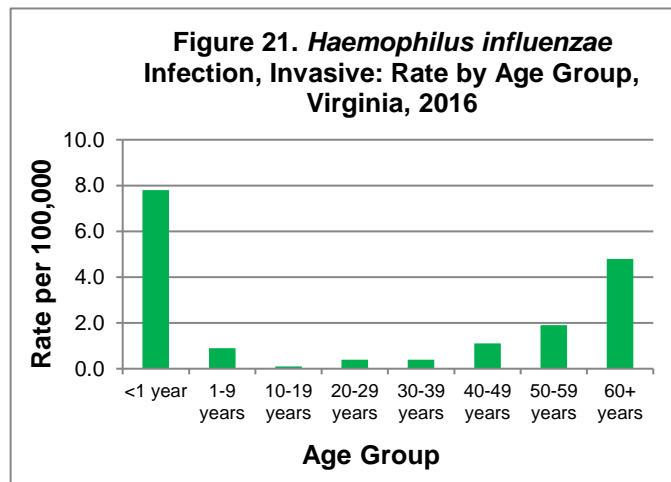
<i>Haemophilus influenzae</i> Infection, Invasive: 2016 Data Summary	
Number of Cases:	142
5-Year Average Number of Cases:	103.2
% Change from 5-Year Average:	+38%
Incidence Rate per 100,000:	1.7

In 2016, 142 cases of invasive *H. influenzae* were reported in Virginia. This represents a 38% increase compared to the five-year average of 103.2 cases per year. This increase could indicate the start of a cyclical trend as incidence rates have risen from 1.1 cases per 100,000 in 2014, to 1.5 cases per 100,000 in 2015, to 1.7 cases per 100,000 in 2016. The rise in incidence is also a reflection of the opportunistic nature of *H. influenzae*, infecting susceptible clients, namely the young and elderly. While culture is the gold standard as a diagnostic test for confirming *H. influenzae*, in 2015 the case definition was updated to include PCR as an acceptable confirmatory laboratory test. For 2016, only one case in Virginia was confirmed by PCR.



The oldest and youngest were the most frequently affected age groups as shown in Figure 21. Infants less than one year of age had the highest incidence rate (7.8 cases per 100,000), while those age 60 years and older had the second highest rate (4.8 cases per 100,000). Incidence rates in the remaining age groups ranged from 0.1 to 1.9 cases per 100,000.

Information on race was not reported for 15% of cases. Among those with a known race, incidence was highest for the black population with 1.8 cases per 100,000, followed closely by the white population (1.4 cases per 100,000) and the “other” race population (1.1 cases per 100,000). Incidence was similar among females and males, with females having a slightly higher rate (1.8 and 1.6 cases per 100,000, respectively).



The highest incidence rate occurred in the central region with 2.2 cases per 100,000, followed closely by the northwest and southwest regions, both with rates of 2.1 per 100,000. Incidence rates for the eastern and northern regions were 1.5 and 1.1 cases per 100,000, respectively. Incidence rates by locality can be seen in the map below. Cases occurred throughout the year with a slight increase (30%) during the fourth quarter.

Serotype information was provided for 123 (87%) of the reported cases. Of these 123 cases, non-encapsulated *H. influenzae* was the most common (93 cases; 76%) strain reported. For the encapsulated strains, serotype f was the most common (21 cases; 17%), followed by serotype a (five cases; 4%), serotype e (three cases; 2%), and serotype b (one case; 1%). The single *H. influenzae* type b case occurred in a female in the 60 year and older age group who was not vaccinated based on age.

No outbreaks of *H. influenzae* were reported in 2016. In total, 16 deaths were attributed to infection with *H. influenzae*; over two-thirds of the deaths (11 cases; 69%) were associated with a nontypable serotype. Over half of the deaths (10 cases; 63%) occurred in persons from the 60 year and older age group.

Haemophilus influenzae Infection, Invasive, Incidence Rate by Locality, Virginia, 2016

